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and

THE SCIENCES SUPPORTING PUBLIC HEALTH

SINCE
1825

HENRY K. MOHLER
1885–1941
Dean, Jefferson Medical College

APRIL
1942

Women . . . . . .
May prepare for tomorrow
TODAY

☆ War, they say, is chemist-fabricated. So, too, may peace be some day synthesized, for tomorrow the scientist will create the very things that nations today fight to possess. In the meantime, the urgent needs of the present and the certain challenge of the future must be imparted to those who are studying science or who are about to launch upon an educational career in that field.

☆ Men, of course, always have had particular aptitude for scientific work. Now, however, the call to arms has depleted somewhat the number of men available for scientific education. And so, while young men will still continue to prepare for careers in science, there will be more and more opportunities for properly qualified young women. In fact, it may be the women scientists of tomorrow who will enable the nation to meet the coming challenge successfully.

☆ It will be no new thing for women to study and to work in science, for many have had enviable careers in the various phases of the sciences supporting public health. Women have peculiar competencies for certain duties, possessing an intuitive facility for doing those things and doing them well. In research, in control, in analytical fields, in fact in all the various ramifications of the health sciences, women have made excellent reputations and will continue to do so and in increasing numbers.

☆ In particular, the ever-increasing demand for women in hospital and retail pharmacy makes the study of pharmacy an ideal opportunity for those who wish to serve in the medical sciences.

☆ The health and morale of the people of this Nation, now and in the future, must be preserved. The challenges of a post-war period must be anticipated and prepared for. The sciences of pharmacy, chemistry, bacteriology and biology are those which will be called upon most urgently, and the personnel of these four major fields must and will be ready.

☆ To those young men who can plan such a life-work, and to those young women who are seeking something really constructive and worthwhile for the future, we recommend these courses of study, which will make available untold opportunities for service as well as for successful and interesting careers.

Philadelphia College of Pharmacy and Science

43rd Street, Kingsessing and Woodland Avenues

Philadelphia, Penna.

FEW thoughts ever recorded are more inspiring than the familiar Scriptural truth, "Seest thou a man diligent in his business and he shall stand before kings." The pharmacist who operates in accordance with the traditions of his profession must be diligent in his business, and in addition must accept a moral responsibility to both the medical profession and the public. He must have available at all times, fresh and pure, the therapeutic agents needed in the relief of suffering and the alleviation of disease.

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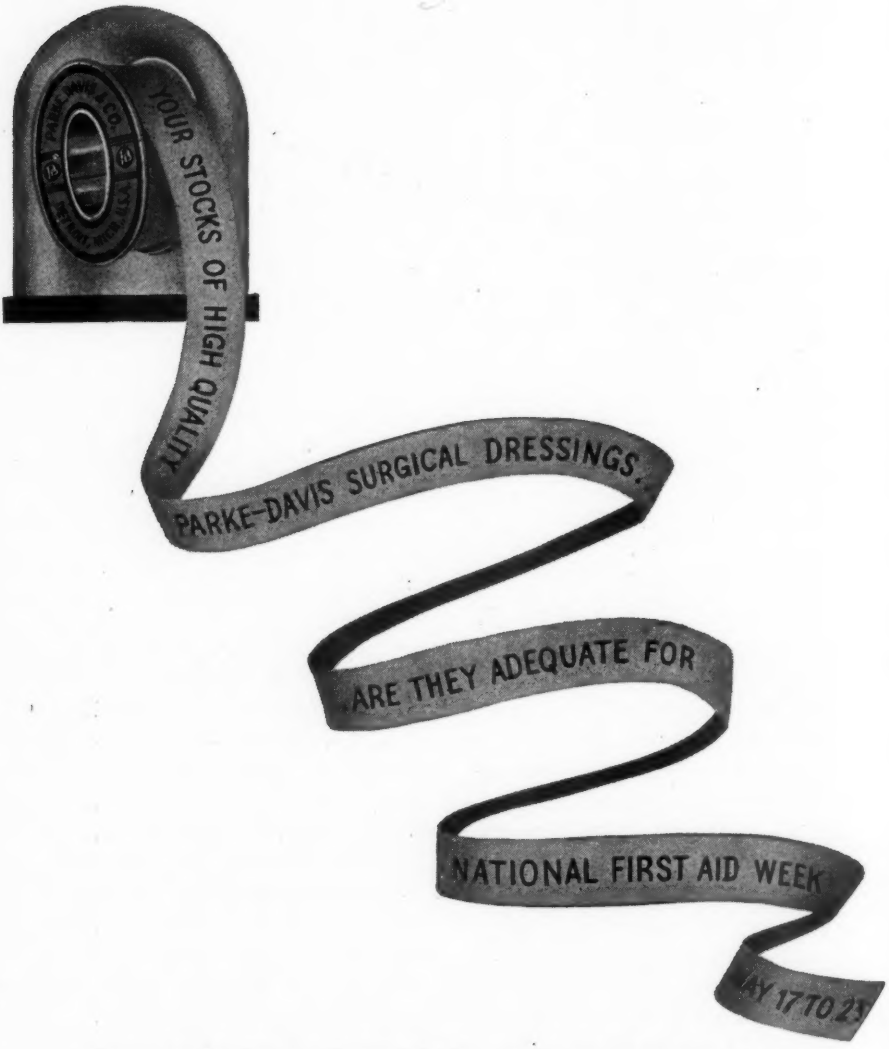

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OUR COVER

MEMOIR OF HENRY KELLER MOHLER *

HENRY KELLER MOHLER was born in Ephrata, Pennsylvania, in 1885, the son of William and Amanda Keller Mohler, both of whom survive him. He was a direct descendant of Ludwig Mohler who emigrated from Switzerland and settled at what is now known as "Mohler's Corner" at Ephrata in the year 1732.

Dr. Mohler's boyhood days were those which could be recounted by the offspring of most of the sturdy pioneer stock that made up young America. While attending grade school, he worked for the local grocer and druggist, and from the latter he received his first inspiration to study medicine.

With this ambition uppermost in his mind, he graduated from the local high school with honors. Leaving home at the age of 16, he came to Philadelphia and obtained a position in a drug store, receiving compensation sufficient only to eke out an existence, but always too proud to ask for assistance from home. Realizing that he could not afford to enter medical college, he decided to enter medicine through the Philadelphia College of Pharmacy—the same avenue traveled by many distinguished men of our profession. I think now of Willis Manges, Fielding Lewis and many others. Henry worked his way through this institution, graduating with honors in 1907. His training in pharmacy and pharmacology served him well in later years when he became Sutherland M. Provost Professor of Therapeutics at Jefferson Medical College.

*By Thomas A. Shallow, Jefferson Medical College, Index Number, Vol. 9, No. 4 (4th Series) February, 1942, "Transactions and Studies of the College of Physicians of Philadelphia."

The program which Henry had outlined for himself was interrupted on his graduation from the Philadelphia College of Pharmacy. Due to the strain of long hours of study and the physical hardships which he had endured for many years, his health failed and he was compelled to return to his home in Ephrata for a year's physical and mental rest.

The following year, 1908, Henry returned to Philadelphia as a student at Jefferson Medical College. Once more he was self supporting, earning his tuition by working as Night Druggist in the Hospital. After studying and working day and night during the entire curriculum, he graduated from Jefferson in 1912, receiving the highest honors in his class.

From this time, his progress was one of continued success. He served Jefferson as Intern, Hematologist, Medical Director, Professor of Therapeutics and Dean of the College.

Dr. Mohler seldom spoke of his ancestors except to say that some one of them served his country from the Revolutionary War to the World War, he, himself, serving in the American Expeditionary Force as Chief of the Medical Service of Base Hospital No. 38, with the rank of Major.

He was recognized by membership in all the leading medical societies in the United States and received honorary degrees from several literary colleges.

Death on May 16, 1941, from cerebral hemorrhage, came at the zenith of his career, cutting short a life which would have added much to the art and science of medicine—but, in the words of Tennyson, "tho' much is taken, much abides".

EDITORIAL

THE TREND OF MEDICINAL AGENTS AND ITS EFFECT ON PHARMACY

PHARMACY, since it is concerned primarily with supplying the medicaments needed by the physician, is profoundly influenced by changes in medical practice insofar as the use of drugs is concerned. Of course one might argue with considerable truth that, to a great degree, pharmacy is responsible for these changes in medical practice through its tireless efforts in finding better and still better drugs to replace those known to be ineffective or imperfect in their action.

When one compares the therapeutic armamentarium of some two or three decades ago with the drugs now so widely used, certain definite changes are immediately seen which are revolutionary in their effect. The days of alteratives, bitters, purges, and "tonics" are all but past and in their place we find drugs which are highly specific in their action, e. g., antitoxins, vaccines, sulfonamides, hormones, arsenicals, etc. The modern physician is indeed fortunate in the drugs placed at his disposal for, with proper diagnosis, there is in many instances a drug acting almost as a specific that he can employ. The simplicity of treating pneumonia today by the use of a sulfonamide is indeed quite different from the arduous task confronting him prior to the development of these specifics.

The dispensing pharmacist who is alive and awake to these changes has become increasingly aware of certain changes in his domain. He is confronted less and less with the problem of how to prepare a satisfactory combination of a polygot list of galenicals. His prescriptions tend more and more toward single drugs and the "art" of compounding some polypharmacal mess no longer merits much attention. There are some in the field of pharmacy who decry these changes and wail that the era of pharmacy is over, and indeed the era of "cook book" pharmacy is done. What pharmacy needs is more vision and less reaction. Vision such as shown by the Victor Company which when the victrola was replaced by the radio met the

issue not by damning the radio but by adapting itself to conditions in such a manner that record sales in recent years have exceeded even those of the pre-radio days.

The pharmacist today has a real challenge, which if properly met, will go far in insuring that public and professional recognition to which pharmacy is justly entitled. This challenge cannot be met without considerable sacrifice and endeavor and it cannot be met at all if scientific advances are ignored in order to keep abreast of merchandising methods, "free goods deals" and all the other diversions of effort which clutter up the time of retail pharmacists. The "forte" of the modern pharmacist should be scientific pharmacy, a field now so involved and extensive that it requires total attention if it is to be mastered at all. Physicians today are so busy with the mechanics of diagnosis and treatment that they have little time in which to keep abreast of modern advances in the newer drugs. It can be truthfully said that they would welcome one upon whom they could depend to supply such information, and it is here that pharmacists can become more properly integrated in the public health picture and on a sound basis.

Unfortunately, not all pharmacists are willing to sacrifice their time and energy in equipping themselves for such service. It is so much more simple to add some new non-pharmaceutical side-line and continue their lament that real pharmacy is a thing of the past.

Physicians *will* and *are* making use of pharmacy in exactly the same ratio as it serves their need. It is not their responsibility to help us but ours to serve them. This we can do and do effectively but half-hearted and slip-shod effort coupled with non-professional store environment cannot be overcome solely by inter-professional relations committees, tirades against dispensing doctors and other well-known and ineffective devices. When pharmacy recognizes its challenge and meets it universally in a manner worthy of a profession, proper recognition, respect and interprofessional good-will will be accomplished without other effort.

Let us stop condoning the glaring deficiencies in pharmaceutical practice as required by the economic pressure of staying in business. Better were it for all to drop to a subsistence level than to lose our professional status.

L. F. Tice.

THE EFFECT OF THE METHOD OF MANUFACTURE ON THE PROPERTIES AND BEHAVIOR OF MILK OF MAGNESIA*

By M. O. Holland

IT has been shown that Milk of Magnesia U. S. P. XI increases in alkalinity on standing at room temperature and at extreme summer heat. Previous workers have found that this condition is aggravated in Milk of Magnesia prepared by the double decomposition method and that this change may be prevented by the addition of a small amount of citric acid. No satisfactory explanation or basis for this phenomenon has been offered. In this work we have attempted a comprehensive study of this subject, especially dealing with those portions which were not investigated by other workers.

Billheimer and Nitardy (1) heated Milk of Magnesia in a glass bottle attached to a reflux condenser to prevent loss of water by evaporation. The bottles were immersed in a water bath at 100° Centigrade. Samples were removed at intervals, tested for taste, and the alkalinity measured. They had previously found that Milk of Magnesia on storage at summer temperature in ordinary glass bottles deteriorated through reaction of the product with the glass resulting in a considerable increase in alkalinity and the development of an unpleasant bitter taste. These changes were produced in a much shorter time by exposure to a higher temperature such as 100° C. The composition of the glass bottle definitely influenced the change which occurred in the Milk of Magnesia on prolonged storage or at high temperatures. This change was retarded by using a harder, less soluble glass, and practically eliminated by using pyrex glass bottles. The addition of 0.1% of citric acid to Milk of Magnesia stabilized it against development of a bitter taste and an increase in alkalinity in an ordinary glass bottle even on storage at elevated temperatures.

Krantz (2) determined the titratable alkali present in a number of samples of Milk of Magnesia containing varying amounts of citric acid and stored in glass bottles in a hot-air oven at 95° C. and con-

*An Abstract of a Thesis Presented to the Philadelphia College of Pharmacy and Science in partial fulfillment of the requirements leading to the degree D. Sc. in Pharmacy.

cluded that citric acid protects the glass against the attack of Magnesia Magma.

Bowles and Merrill (3) studied the change in pH of Milk of Magnesia made by the direct hydration and double decomposition methods on standing in ordinary glass bottles and also investigated the two milks with small amounts of citric acid added for change in pH value upon standing in similar glass bottles. The pH determinations were made at 20° C. with a glass electrode and vacuum tube potentiometer. The Milk of Magnesia was tested at intervals over a nine-months' period of storage. The authors confirmed the work of Billheimer and Nitardy on Milk of Magnesia made by the standard double decomposition method and concluded the following:

> The pH of Milk of Magnesia made by direct hydration and stored in ordinary glass bottles for nine months increased but slightly (about 0.07 of a pH unit) whereas the pH of Milk of Magnesia made by the standard double decomposition method and treated similarly increased considerably (about 0.6 pH). The pH of Milk of Magnesia made by both methods, containing 0.1% Citric Acid, and stored for nine months in ordinary glass bottles showed no apparent appreciable change.

From this survey it is seen that Billheimer and Nitardy studied the changes as evidenced by taste and alkalinity in Milk of Magnesia, made by double decomposition only, heated at 100° C. Krantz in repeating these experiments correlated the change in taste and alkalinity with an increased titratable alkalinity in the clear filtrate. Bowles and Merrill studied the pH changes of Milk of Magnesia prepared by both methods and stored at room temperature only.

Although a difference in behavior of the two products has been described, no explanation has been offered for this difference in the results obtained with the product made by double decomposition as compared with that made by the hydration method. It is clear that some, as yet unexplained, difference exists in Milk of Magnesia depending upon the method employed in its manufacture and as a result this investigation was begun with the following objectives:

> 1. To determine the changes occurring in Milk of Magnesia U. S. P. XI made by the "hydration" and "double decomposition" methods, during storage for periods of several months at room temperature, in ordinary glass bottles, in pyrex flasks and in quartzware;

2. To determine the changes occurring in Milk of Magnesia U. S. P. XI made by the "hydration" and "double decomposition" methods, during storage in ordinary glass bottles, in pyrex glass flasks and in quartz flasks, at an elevated temperature simulating intense "summer heat," to hasten such reactions;

3. To determine the degree of stabilizing action of citric acid upon Milk of Magnesia U. S. P. XI prepared by "hydration" and "double decomposition" methods, stored at room temperature and at elevated temperatures in flint glass bottles, pyrex glass flasks and in quartzware flasks;

4. To attempt to find a reasonable explanation for the apparent difference in behavior of Milk of Magnesia according to its method of manufacture.

Method of Preparation

Hydration

In a graduated pyrex flask were placed 292.32 gm. of magnesium oxide, light powder, and enough distilled water at 20° C. added to make 4000 cc. of finished product. The suspension was thoroughly agitated, and allowed to stand, with frequent agitation, for two days, until thorough hydration occurred. The product was passed twice through a homogenizer to produce thorough particle dispersion. A very thick, viscous magma was produced.

The product was assayed by the official method, adjusted to the approximate desired strength, then reassayed as a check. The pH value was determined using the glass electrode.

Double Decomposition

Nine hundred grams of magnesium sulfate were dissolved in 1950 cc. of distilled water and heated to boiling. Three hundred grams of sodium hydroxide pellets were dissolved in 3000 cc. of distilled water, added slowly to the boiling magnesium sulfate solution, and boiled for thirty minutes. The product was transferred to a capacious pyrex vessel and washed with boiling distilled water until free from sulfates, as shown by testing with barium chloride T. S. When washed sufficiently, it was concentrated by allowing to settle, and decanting. When 4000 cc. remained, it was assayed and adjusted to desired strength. The product was assayed again to check and the pH determined using the glass electrode.

Apparatus

The containers used for storage of the Magnesia Magma comprised quartz flasks, quartz test-tubes, pyrex glass flasks, and "Owens-Illinois" flint glass bottles. Rubber stoppers were employed to tightly seal the containers, those placed in the oven being tied securely to retard loss of moisture.

Black plastic (bakelite) screw-cap tops were employed at early stages of the experiments as closures for flint glass bottles in the oven. Due to excessive loss of moisture, the experiment was repeated using rubber stoppers and securing them in the bottle as described above.

Procedure

The experiments were conducted as follows: Four groups of containers were prepared, each group consisting of two containers of quartz, two of pyrex and two of flint glass. Each group was filled with one of the four following types of magmas, one prepared by the double decomposition; by hydration; by double decomposition with 0.1% added citric acid; and by hydration with 0.1% added citric acid. One set of four different type containers for each type magma was stored in a hot air oven at 95°-100° C. for a period of time. These were removed and tested at intervals, being allowed to cool to room temperature before removal of the stopper. The contents of each were assayed and the pH value determined. Another complete series of magmas in different containers were allowed to stand at room temperature (approximately 20° C.). At intervals of time samples of these lots were inspected and assayed, and the pH values of the contents determined.

The Milk of Magnesia samples were tested at intervals by a modification of the U. S. P. XI assay in order to detect very slight changes, if such occurred. A 0.5 gm. sample dissolved in 25 cc. of N/10 H_2SO_4 V. S. and the excess titrated with N/10 NaOH V. S.

The pH was determined with the glass electrode and the Leeds & Northrop Potentiometer. In the case of the product made by hydration the pH was found to drop slowly after its manufacture coming to an equilibrium after a few days.

Control

Because of discrepancies noted in the determination of the pH of other substances, when the glass electrode used for the Magma Magnesiæ experiments was employed, a standard buffer solution and a sample of Magma Magnesiæ were tested with the original electrode and with one freshly prepared. The results checked within 0.007 pH which is within the experimental error of this apparatus.

Experimental Data

The Magma Magnesiæ U. S. P. XI, prepared by the "double decomposition" method, was placed in a quartz flask and the container securely sealed with a rubber stopper tied with heavy cord. The flask was placed in a hot air oven at 95° C.-100° C. The product at intervals was assayed for strength, and the pH value determined, with the results as given in Table I.

TABLE I

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, Stored in Quartz Flasks at 95° C.-100° C.*

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.46	10.18
56.75	7.54	10.10
145.	7.81	10.12
193.	7.19	10.14
261.	7.26	10.12

Another lot of the "double decomposition" product was placed in "pyrex" glass flasks, stored at 95° C.-100° C. in a hot air oven, and the assay strength and pH value determined as before. The results are given in Table II.

*Each recorded reading included in these tables represents an average of at least two, and in the majority of instances, three separate determinations carried out to insure accuracy of experimental results.

TABLE II

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, stored in "Pyrex" Glass Flasks at 95°-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.46	10.18
68.5	7.12	10.04
140.	7.58	10.17
192.	7.39	10.12
260.	7.31	10.10
308.	7.55	10.24

A third portion of the "double decomposition" product was placed in "flint" glass (ordinary glass), stored at 95° C.-100° C. in a hot air oven, and the assay strength and pH value determined as before. The results are given in Table III.

TABLE III

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, Stored in "Flint" Glass at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.46	10.18
68.5	7.49	10.22
140.	7.51	10.83
192.	8.08	11.80
260.	8.16	12.66

The magma, prepared by the "hydration" process, was subjected to the same course of treatment, stored in quartz flasks, "pyrex" glass containers, and "flint" glass containers. The strength was assayed, and the pH determined, at intervals. The results are given in Tables IV, V, and VI.

TABLE IV

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, stored in Quartz Flasks at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.81	9.89
56.75	7.87	9.92
145.	7.89	10.1
193.	7.88	10.08
261.	7.92	10.06

TABLE V

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, stored in "Pyrex" Flasks at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.81	9.89
56.75	7.57	9.92
145.	7.78	10.11
193.	7.64	10.14
261.	7.71	10.17

TABLE VI

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, stored in "Flint" Glass containers at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.81	9.89
71.5	7.70	9.99
134.5	7.97	10.25
186.5	8.31	10.36
258.	9.00	10.59

An additional lot of U. S. P. XI Magma Magnesia was prepared by the "double decomposition" method. The pH value of this magma was 10.47, which was reduced to 10.05 by the addition of 0.1% citric acid to the product. A portion of this milk of magnesia was subjected to the same treatment. The results are given in Tables VII, VIII and IX.

TABLE VII

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, With 0.1% Citric Acid Added. Stored in "Quartz" Flasks at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.36	10.05
50.	6.95	10.06
138.	6.98	10.12
188.	7.09	10.03

TABLE VIII

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, With 0.1% Citric Acid Added. Stored in "Pyrex" Flasks at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.36	10.05
50.	7.20	10.07
138.	6.98	10.08
188.	7.17	10.13

TABLE IX

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, With 0.1% Citric Acid Added. Stored in "Flint" Glass at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.36	10.05
50.	7.13	10.26
138.	7.01	10.53
188.	7.30	10.99

Another lot of U. S. P. XI Magma Magnesia, prepared by the "hydration" method and possessing a pH value of 10.33, which was lowered to 10.07 by addition of 0.1% citric acid, was carried through the process as outlined above, employing quartz flasks, "pyrex" glass containers, and "flint" glass containers, and storage at 95° C.-100° C. The results of determinations of assay strengths and pH values are stated in Tables X, XI and XII.

TABLE X

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, With 0.1% Citric Acid Added. Stored in Quartz Flasks at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.28	10.07
86.75	9.06	10.07
133.75	8.62	10.06
176.75	8.61	10.10
225.75	8.62	10.09

TABLE XI

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, With 0.1% Citric Acid Added. Stored in "Pyrex" Glass at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.28	10.07
86.75	7.45	10.08
133.75	7.71	10.07
176.75	8.00	10.10
225.75	8.13	10.12

TABLE XII

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, With 0.1% Citric Acid Added. Stored in "Flint" Glass at 95° C.-100° C.

Elapsed time (in hours)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.28	10.07
86.75	8.03	10.25
133.75	8.18	10.45
176.75	8.31	10.53
225.75	8.46	10.87

A third lot of U. S. P. XI Magma Magnesia by the "double decomposition" method was placed in quartz, "pyrex" glass, and "flint" glass (ordinary glass) containers as previously described, and these were allowed to stand at room temperature. The pH value and assayed strength were determined at intervals of one month or more. The results are found in Tables XIII, XIV, and XV.

TABLE XIII

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, Stored in Quartz Flasks at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.46	10.18
1.	7.73	10.02
4.5	7.49	10.12
12.	—	10.53

TABLE XIV

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method and Stored in "Pyrex" Glass Flasks at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.46	10.18
1.	7.19	10.14
2.	7.12	10.11
3.	7.51	10.00
4.5	7.49	10.08
12.	—	10.51

TABLE XV

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, and Stored in "Flint" Glass at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.46	10.18
1.	7.67	10.12
2.	7.11	10.14
3.	7.48	10.05
4.5	7.44	10.08
12.	—	11.92

Another lot of Magma Magnesiæ U. S. P. XI made by the "hydration" method, was stored in quartz, "pyrex" glass and "flint" glass (ordinary glass) containers at room temperature for several months. The pH value and assay strength determined at intervals are shown in Tables XVI, XVII, and XVIII.

TABLE XVI

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method. Stored in "Quartz" Flasks at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.81	9.89
1.	7.88	10.04
2.	7.85	10.04
4.5	7.81	9.95
12.	—	10.07

TABLE XVII

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, and Stored in "Pyrex" Glass at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.81	9.89
1.	7.83	10.04
2.	7.53	10.04
3.	7.81	9.95
4.5	7.81	9.95
12.	—	10.04

TABLE XVIII

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, and Stored in "Flint" Glass at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.81	9.89
1.	7.96	10.02
2.	7.88	10.02
3.	7.84	9.95
4.5	7.79	9.99
12.	—	10.1

A fourth lot of "double decomposition" method U. S. P. XI Magma Magnesiæ with 0.1% citric acid, was stored for several months in quartz, "pyrex" glass and in "flint" glass (ordinary glass) containers. At various intervals the pH value and assay strength were determined as shown in Tables XIX, XX, and XXI.

TABLE XIX

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, With 0.1% Citric Acid Added. Stored in "Quartz" Flasks at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.36	10.05
1.	7.33	10.01
3.	7.30	10.00
12.	—	10.05

TABLE XX

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, With 0.1% Citric Acid Added. Stored in "Pyrex" Flasks at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.36	10.05
1.	7.35	9.99
3.	7.31	9.98
12.	—	10.05

TABLE XXI

U. S. P. XI Milk of Magnesia, Prepared by the "Double Decomposition" Method, With 0.1% Citric Acid Added. Stored in "Flint" Glass at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.36	10.05
1.	7.38	10.07
3.	7.32	9.99
12.	—	10.05

A fourth lot of U. S. P. XI Magma Magnesiæ, prepared by the "hydration" method with 0.1% citric acid added, was given treatment similarly to the preceding. The pH value and assay strength were determined at intervals with the results shown in Tables XXII, XXIII, and XXIV.

TABLE XXII

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, With 0.1% Citric Acid Added. Stored in "Quartz" Flasks at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.28	10.07
1.	7.25	10.06
3.	7.26	9.94
12.	—	10.07

TABLE XXIII

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, With 0.1% Citric Acid Added. Stored in "Pyrex" Flasks at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.28	10.07
1.	7.30	10.07
3.	7.31	10.06
12.	—	10.07

TABLE XXIV

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, With 0.1% Citric Acid Added. Stored in "Flint" Glass at Room Temperature.

Elapsed time (in months)	Assayed strength (% $Mg(OH)_2$)	Recorded pH value
0.	7.28	10.07
1.	7.26	10.10
3.	7.27	10.02
12.	—	10.07

Discussion of Storage Experiments

From the foregoing tables certain observations may be made which follow: Storage of the double decomposition product for a limited time at high temperature (95-100° C.) did not result in any appreciable rise in pH unless stored in ordinary glass. (Tables I, II and III.) When stored for a prolonged period (1 year) at room temperature an appreciable rise in pH was observed in all types of containers but the greatest rise being in the ordinary glass containers. (Tables XIII, XIV and XV.) Similar experiments using milk of magnesia made by the hydration method showed that when stored for a limited time at high temperature (95-100° C.) no appreciable rise in pH was observed unless stored in ordinary glass (Tables IV, V and VI) but that even here the change was much less than that observed with the double decomposition product (compare Tables III and VI). When the "hydration" product was stored at room temperature no appreciable rise in pH was observed in any type of container. (Tables XVI, XVII and XVIII.)

The addition of 0.1% of citric acid to the product made by double decomposition caused it to behave in a manner quite similar with that observed with the hydration product under all conditions of storage. (Tables VII, VIII, IX, XIX, XX, XXI.)

The variations in per cent of $Mg(OH)_2$ present from time to time are believed to be due to the difficulty in obtaining a representative sample as well as a slow loss of moisture which was not entirely prevented by the method of stoppering employed.

The observation that the double decomposition product underwent a slow change in pH when stored at room temperature even in quartzware seemed to indicate the probability of some intrinsic factor not due to the chemical nature of the container. This might conceivably be due to 1. Some protective influence in the hydration product not present in the double decomposition product or 2. some substance such as bound or adsorbed fixed alkali in the double decomposition product which was slowly released upon standing and which would be expected to intensify its action on glass. The following experiments were performed in an attempt to test this reasoning.

Test for Protective Action of Hydration Filtrate

The possibility that soluble salts present in the magma prepared by the "hydration" process might be the factor protecting the magma prepared by that process was investigated as follows:

Four hundred grams of the "hydration" product having a pH value of 10.35 were filtered through a Buchner funnel. The subsequent filtrate of 169 cc. had a pH value of 9.66. This was evaporated to 20 cc. in the hot air oven at a temperature of 100° C. It was then added to 150 gm. of the "double decomposition" product with a pH value of 10.12. After addition of the filtrate to the "double decomposition" product the pH value of the mixture was found to be 10.13. This mixture was then divided into two equal portions and placed in "flint" glass bottles tightly secured with rubber stoppers, and the bottles placed in the oven at 95° C.-100° C. to determine whether the salts present in the filtrate of the "hydration" magma would protect the "double decomposition" from a considerable rise in alkalinity. After 100 hours in the oven, the pH value was determined with the glass electrode and potentiometer.

The pH values were found to be 10.83 and 11.15. After 111 additional hours treatment in the oven, the pH values were found to be 12.33 and 12.42 respectively.

Thus, in 211 hours, the magmas showed an increase in alkalinity of 2.20 and 2.29 pH units respectively. This is comparable to the increase in the same "double decomposition" product when subjected to the same temperature but with no added material (increase of 2.43 and 2.48 units pH in 188 and 260 hours respectively.) Apparently the hydration filtrate has no protective action on the "double decomposition" product and has no inherent buffer action.

Test for Presence of Adsorbed Alkali

The experimental procedure used to investigate the possibility of adsorbed sodium hydroxide being present in the double decomposition product was as follows:

A weighed amount of the magnesia magma of each type was placed in separate tared and graduated "pyrex" flasks. The magma was placed in an electric oven at 95° C.-100° C. until it approached dryness. The partially-dried substance was removed from the flask, powdered thoroughly by trituration and replaced in the flask, which was then returned to the oven for several days additional storage at

the same temperature to insure thorough drying of the magma. When thoroughly dry, sufficient distilled water was added to the material to bring to the original volume. The magma was allowed to stand, with frequent agitation, for twenty-four hours. The excess solid material was filtered off and the filtrate evaporated in the oven to 70 cc., and allowed to stand overnight to come to equilibrium. The pH values were then determined at 25° C., employing the potentiometer and glass electrode. The titratable alkali present was determined with N/100 H_2SO_4 using bromthymol blue as an indicator, and titrating each to the same color.

* * *

Extraction Experimental Data

The results obtained with the "extraction" experiments are presented below.

TABLE XXV

	#1		#2		pH of
Magma	pH	%	pH	%	filtrate
Double decomposition	10.42	7.00	10.42	7.00	9.46
Hydration	10.43	7.10	10.43	7.10	9.14
pH of Extract					
Double decomposition	8.54		8.52		
Hydration	8.01		8.08		
Difference	.53		.44		
cc. H_2SO_4 N/100 required to neutralize extract from 100 gm. of magma					
Double decomposition	2.26		2.03		
Hydration	1.09		1.08		
Difference	1.17		.95		
cc. difference calculated as grams of NaOH excess in 100 grams of "double decomposition" product	.000468		.000380		

From the above data, there seemed to be a difference existing between magma magnesia prepared by the "hydration" method and that made by the "double decomposition" method from the standpoint of soluble alkali.

* * *

A further study was made to determine whether alkali added to the magma made by the "hydration" method would cause the magma to become more alkaline, and subsequently attack glass in containers.

To ten samples of 200 gm. each of the "hydration" magma were added various increments of sodium hydroxide solution (0.2-1.5 cc. of NaOH containing 0.003759 gm. per cc.). Each sample was heated in a stoppered "pyrex" flask on a boiling water bath for a half hour, and then allowed to stand overnight at room temperature to reach equilibrium. The pH values were then determined with the glass electrode. Each sample was placed in a "flint" glass bottle with a securely tied rubber stopper, and the whole placed in the electric oven at 95° C.-100° C. for 142 hours.

A control was run with the original magma with no added alkali, but preheated, and then placed in the oven.

The results obtained from these experiments are presented below.

TABLE XXVI

U. S. P. XI Milk of Magnesia, Prepared by the "Hydration" Method, Preheated, and Stored in "Flint" Glass Bottles at 95°-100° C. Varying Amounts of NaOH Added to Increase Alkalinity.

Gms. NaOH added per 100 gm. magma	pH after preheating half hour	pH after 142 hrs. at 95-100° C.	pH after 307 hrs. at 95-100° C.	Amount of increase in pH value
0	10.44	10.57	11.56	1.12
0.00037	10.44	10.91	12.60	2.16
0.00094	10.44	11.00	12.84	2.40
0.00188	10.44	10.53	12.80	2.36
0.00282	10.48	10.54	12.78	2.30

From these results it was shown that the addition of sodium hydroxide to the product made by the hydration method and in

amounts comparable to that found in extraction experiments caused the hydration product to behave in a manner comparable to that of the double decomposition preparation insofar as its effect on flint glass at high temperature was concerned.

Summary and Conclusions

1. Milk of magnesia made by the double decomposition method when stored at high temperature does not increase appreciably in pH when in quartz or "pyrex" containers, but does when stored in flint glass.

2. Milk of magnesia made by the hydration method when stored at high temperature does not increase appreciably in pH when in quartz or "pyrex" containers but increases somewhat when stored in flint glass. This increase is not however comparable to that observed with the double decomposition product.

3. When stored at room temperature for one year milk of magnesia prepared by the double decomposition method rises in pH even in quartzware but not as much as in flint glass.

4. The product made by hydration when stored at room temperature for one year remains unchanged in quartzware and pyrex but rises slightly in flint glass.

5. The addition of 0.1 per cent. citric acid to the double decomposition product causes it to behave in a manner identical with the hydration product under all conditions of storage.

6. No buffering effect was found to exist in the filtrate from the hydration product insofar as its power of stabilizing the double decomposition product was concerned.

7. When the two types of products were completely dried and then extracted with water and the extracts filtered, the filtrate from the double decomposition product was both higher in pH and possessed a greater amount of titratable alkali.

8. When an amount of sodium hydroxide approximately equivalent to this difference in titratable alkali was added to milk of magnesia

made by the hydration method it then behaved in the same manner as that made by double decomposition in its effect on flint glass at high temperature.

9. The theory is advanced that the difference in behavior of these two products is due to the presence of traces of sodium hydroxide in the double decomposition product existing either as an adsorbate or as a double salt and that the protective action of citric acid is due to the formation of a buffer which prevents its action which otherwise would be superimposed on that of the magnesium hydroxide. This theory is in accordance with the known likelihood of hydroxyl ion adsorption when precipitation of a hydroxide particle is produced. It furthermore offers an explanation of the slow rise in pH observed with the double decomposition product when stored for one year in quartzware since with a slow growth of particle size on long standing some desorption would be expected.

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THE FACTS ABOUT SUGAR

By T. Swann Harding

NOW that sugar bootleggers have appeared suppose we take a gander at the facts. We Americans consume about seven million tons of sugar a year. Compare that with the three million tons consumed by the much larger population of Soviet Russia. But suppose we figure on an individual basis.

In 1630 sugar was a drug, and it was so scarce that a small monthly allowance was doled out at the largest hospital in Paris by a woman who had to take oath that it left her stocks only to go into medicines compounded by physicians. In 1819 the population of Great Britain consumed only 17 pounds of sugar each per year, but a little over a hundred years later they had stepped that up to 90 pounds or so.

In such countries as Australia, New Zealand, Denmark, the United Kingdom, and the United States annual sugar consumption in recent years has run from 100 to 112 pounds a head. In short, we Americans consume about 2 pounds of sugar per week each. That covers only sugar purchased as such, and not the large quantities we also get in soft drinks, candies, cakes, preserves, ice cream, and such.

Roughly two-thirds of all the sugar is consumed in homes and in restaurants and one-third is used in processed or manufactured products. If it is assumed that an average family consists of 3.77 persons, and social scientists usually make this assumption, that means that the average American family gets away with 7.54 pounds of sugar a week. That's just too dog-gone much sugar anyway.

Take the United Kingdom for purposes of comparison. In normal times its average family of the same size consumed a little less than 5 pounds of sugar weekly as compared with our 7.54. The current sugar ration in Britain for a family of this size is 12 ounces weekly.

The current plan will ration American families at a rate of about 2 pounds of sugar weekly. Again that would be only the sugar we purchased or used as such. But it is as much sugar as a British family gets in all forms weekly, for jam, marmalade, syrup, and molasses also are rationed in Britain.

In general British sugar consumption is now about 40% of pre-war levels. It is also but 70-82% of the German ration, depending upon the type of Britisher used for the comparison. Sugar is an energy food and Britishers who do heavy work get increased rations. On the other hand British medical authorities were protesting a decade ago that increased sugar consumption was leading to bad health.

Sugar is a pure chemical substance, unlike most other foods. It is highly processed and devoid of vitamins, protein, and fat. It is pure carbohydrate and tends too much to displace fat in children's diets. Our physiological tolerance for sugar is not unlimited. What is more there is good evidence that high sugar consumption leads to increased incidence of and death from catarrhal troubles, bronchitis, and pneumonia. Possibly also excess sugar adversely affects the pancreas.

Perhaps it is fortunate then that we waste a great deal of the sugar we used. A hurried survey made in New York City restaurants indicated it was a rare empty coffee or tea cup which did not still contain at least half a teaspoonful of undissolved sugar. The Secretary of Agriculture was right not long ago when he said that we were not only the most wasteful people on earth but that we had for years constantly invented new and better wastes.

We produce in the continental United States only 29% of the sugar we use. Of this 23% comes from beets and 6 from sugar cane. The continental U. S. A. sugar industry is largely an artificial one that has always required subsidy. It is uneconomical for us to produce our own sugar and any large increase in domestic continental production is unwarranted in the long run.

Under the Jones-Costigan Act of 1934, revised into the Sugar Act of 1937, the remainder of our sugar normally comes from the following sources in the percentages indicated: Hawaii 14, Puerto Rico 12, Cuba 29, the Philippines 15, the Virgin Islands 0.1, and other foreign countries less than 1%.

Early in 1942 the facts about sugar were these: If to refiners' stocks and manufacturers' reserves on hand in December, 1941, was added our anticipated 1942 continental U. S. A. sugar production we should have a base supply of 3,150,000 tons. During the past four years our average domestic production of beet sugar has been about 1,758,000 with an all-time high of 1,894,000 tons in 1940. For the

same period our average mainland production of cane sugar has been 463,000 tons a year, with an all-time high of 583,000 in 1938.

On the assumption that we would require a little over seven million tons of sugar in 1942, and that we had a base supply of 3,150,000 tons, we should have to procure nearly four million tons somewhere else. We could probably count on a million tons from Puerto Rico, four million from Cuba, and a few thousand from the Virgin Islands. That looked like over five million tons. Where then was the shortage?

In accord with original plans about a million tons of Cuban were to be used to produce industrial alcohol which we require in greatly increased amounts during war. Then the Cubans themselves consume nearly a quarter of a million tons locally, in 1941 Great Britain took over half a million tons of Cuban sugar, and Cuba sells some 75,000 tons normally to other markets.

So instead of getting over five million tons from the Caribbean it looked as if we should do well to get a little over three million. That would mean a 900,000-ton shortage on the assumption that we must consume as usual in 1942. Both Hawaii and the Philippines normally send us that much sugar but in 1942 we shall be lucky to get half the usual shipments from the former while we can count on none at all from the latter.

There are also other uncertain factors, such as the possible demands of Russia and others of the United Nations and the shipping situation. During 1941 our sugar was used so fast that more than a million tons disappeared from our Ever Normal Granary reserves. Some of this sugar was hoarded by concerns making soft drinks and other products requiring sweetening, some by panic-buying consumers.

This buying produced actual temporary shortages. No scheme the Government can set up short of strict rationing will ensure the basic needs of all because unexpected factors are always upsetting it. Even the actual rations must be changed if other urgent needs draw away the supplies.

The hope of some that sugar shortages can be avoided by using honey is false. We normally consume only about 1½ pounds of honey each per year as compared with something like 104 pounds of sugar. If the honey industry were greatly expanded it would rest on an artificial demand which would largely collapse when peace came.

The main problem here is to prevent unwise expansion and to see to it that such honey as is available goes to consumer tables, not to industry.

It is true that higher prices for sugar, increased Government payments, and removal of limitations on acreages of sugar beets and sugar cane may be expected to increase continental U. S. A. production to a considerable extent. At this writing expectations to plant sugar beets indicate a crop nearly a fourth larger than in 1942, but the labor situation is bad. In any case both beets and cane have been planted in amounts to tax our processing plants to the limit.

As fixed by the Office of Price Administration wholesale sugar prices for the refined grade are about a dollar a hundredweight higher than the average in 1938-40. The base rate of conditional payments to domestic sugar producers had been increased one-third under legislation recently approved by the President and which extended the 1937 Sugar Act for three more years.

Some time ago we purchased the entire Cuban sugar crop for the year. It was then expected to be from 4,000,000 to 4,300,000 tons. It has turned out to be nearer 4,600,000 tons. Meanwhile Mr. Batt has said that as a result of using grain for making industrial alcohol about 550,000 more tons of sugar than were anticipated will be available for other use this year. These are favorable factors.

On the other hand the United Nations will require from us at least a million tons of sugar. The chief Ethiopian in the woodpile, however, is lack of shipping. There is enough sugar, but we do not have bottoms to spare to get it to this country. Sugar is piling up right now in Puerto Rico where storage facilities are meager, though Cuba has storage space to take care of her excessive stocks.

Rationing has been invoked not because of scarcity of sugar but in part because of panic buying and largely because we lack shipping facilities to bring luxury supplies of sugar into this country. We must ration to effect equitable distribution. We shall in any case have more than enough sugar for our health's sake this year. For we normally waste and eat too much of it. We shall no doubt be far better off physically if our ration finally drops to the German or even to the British level, assuming we have an otherwise well-balanced diet sufficiently rich in energy foods.

DETECTION OF CARAMEL IN WINES

By Charles Milos

CARAMEL is precipitated from aqueous solutions in the presence of fixed acids, such as malic, citric and tartaric, upon the addition of various solvents. The presence of sugar hastens the precipitation. After numerous tests the solvent best suited for this purpose was found to be a mixture of alcohol and ether. Sugar is precipitated in saturated sugar solutions, but in dilute solutions no precipitation takes place. Coal-tar dyes and vegetable colors are also precipitated. Tannins are not precipitated. In deep colored wines many of the anthocyanins and flavones are precipitated.

When the precipitate is washed first with hot 85% alcohol containing 0.5% by volume of concentrated hydrochloric acid (specific gravity 1.19), and the washing is completed with hot 85% alcohol until the filtrate is colorless, interfering substances such as coal-tar dyes, vegetable colors, anthocyanins, and flavones are eliminated, and the caramel remains.

If necessary, the residue can be further cleaned by dissolving in water and precipitating the caramel with zinc hydroxide and washing as directed in Methods of Analysis, A. O. A. C., 1940, p. 252, par. (f). The precipitation with zinc hydroxide, if directly applied to wines, fails to give satisfactory results. Practically all the coloring matter in the wines is precipitated by the zinc hydroxide, and on prolonged washing the caramel is lost.

The following method is presented:

Method

To two separate portions of 25 ml. of wine in a 250 ml. Erlenmeyer flask, add 50 ml. of 95% ethyl alcohol and 50 ml. of ethyl ether, stopper flask, shake well and allow to stand. Should two immiscible layers form after the solution has stood for some time, add more alcohol (25 ml. is usually sufficient). Shake well and allow to stand.

In the presence of appreciable quantities of caramel an amorphous precipitate will form on the bottom of the flask within a few hours. If no precipitate forms after a few hours, allow to stand over night.

Filter the solution through a Buchner funnel, using a filter paper. Wash the residue remaining in the flask and on the filter paper with hot 85% alcohol containing 0.5% HCl, using 10-15 ml. portions until the filtrate no longer shows presence of a red or pinkish color. Then wash several times with hot 85% alcohol. Place the filter paper in the flask, add 10 ml. of water and heat gently until the residue dissolves. Cool, filter and test for caramel. If the precipitate does not dissolve readily, make the aqueous solution alkaline with 2% KOH, adding one to two drops and heating gently until the precipitate dissolves.

Some Tests for Caramel

To 2 ml. of the solution, add 0.5 ml. of 10% NaOH solution and boil. (Caramel darkens slightly.) Cool, add 10 ml. of Marsh reagent (2), and shake well. (Caramel does not dissolve in the Marsh reagent) (3).

Add a few drops of HCl to 2 ml. of the solution. (Caramel lightens slightly.) Add 10 ml. of the Marsh reagent and shake well. (Caramel does not dissolve in the Marsh reagent.) A change of color to pink or red on the addition of the HCl indicates the presence of wine colors.

To 2 ml. of the caramel solution in a test tube add 3-5 times the volume of paraldehyde and just sufficient absolute alcohol to form a homogeneous solution. Stopper the tube. The formation of a brownish precipitate indicates caramel. Samples containing small amounts of caramel may need to stand over night.

To 2 ml. add an equal volume of freshly prepared reagent consisting of phenylhydrazine hydrochloride, 2 parts; sodium acetate, 3 parts; water, 20 parts. The formation of a dark brown precipitate indicates caramel (4).

Transfer 10 ml. of the solution to a separator, and shake out separately with chloroform, ether, petroleum ether, ethyl acetate, carbon tetrachloride and amyl alcohol. Caramel is insoluble in all of these solvents.

Summary

A method is given for the separation and detection of caramel in wines.

The method cannot be relied upon to give exact quantitative results. Some types of caramel are precipitated completely and others only partially.

The quantity of caramel that can be isolated depends upon the type of caramel present, but in general quantities of caramel sufficient to give an appreciable color to wine can be readily detected.

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OUR CONTRIBUTORS' PAGE

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THE HELP OF THE PHARMACIST IN VENEREAL DISEASE CONTROL

The following brochure, distributed by the Pennsylvania State Venereal Disease Control Committee, is reprinted here since it may well serve as a guide in other states where the intelligent cooperation of the pharmacist in this program should be sought. In far too many cases pharmacists have been collectively castigated for the evils of a few. By the cooperative effort of both physicians and pharmacists, such as that leading to this publication, we can expect real progress rather than inter-professional name calling which brings neither profit nor advantage to either profession and disregards the real issue involved.—Ed.

THE pharmaceutical profession holds a key position in the front against venereal disease. It is safe to say that if the druggist will use his influence, join a coordinated plan, do his educational work and steer those who consult him in the right direction, he can make the difference between success and failure. His non-cooperation can bog down an otherwise effective program as badly as any agency in the field. A heavy share of responsibility for seeing through this vital phase of defense rests on him. It is to him that the person who fears he has or will acquire syphilis and gonorrhea often comes for first aid.

The Pharmacist as a Personal Influence:

The drugstore is often the social center of a neighborhood. It is often a gathering place and refreshment spot for young people, at the age when the start toward venereal disease is most often made. The socially minded head and personnel of such establishments can (a) discourage off-color frequenters looking for pick-ups and trouble; (b) give friendly advice and even sober counsel to some who are obviously on the way to going wrong; (c) urge blood tests and medical examination on persons who are known to have exposed themselves. (The Venereal Disease Control Division of the Philadelphia Department of Public Health maintains a 24-hour telephone inquiry service (LOC 2702) that requires no identification of the caller. It is available from your pharmacy and will help you help some fellow or girl who needs us).

The Pharmacist as an Educator:

The corner druggist's establishment can be as much of a center for public health and preventive medicine as the physician's office,

the hospital, the Health Department in the City Hall. The pharmacist behind the counter has the first chance:

(1) *To give or sell prevention* to the person who may expose himself (or herself) to venereal disease. He can be sure the prophylactic or the kit is a top-grade approved product. A list of products and manufacturers meeting the highest requirements can be secured. They can be sold at a fair price and a fair profit. If you see a proper use for free distribution, let your City or State venereal disease department know.

(2) *To give or sell prevention* to the person who has exposed himself (or herself).

Time is critical in post-exposure prophylaxis—and next to promptness, *intelligent and thorough application.* Even a little liquor, "the ounce too much", just fuzziness, not outright intoxication, delays action enough to open the door to disease.

Can you do anything to educate the purchasers and users of prophylactics to use them quickly and effectively?

Can you do anything to suggest a place under proper supervision where a prophylactic can be applied? The City Venereal Disease Control Division will help if you wish.

Can you steer an exposed person to one of the Health Department's hospital prophylactic stations? If he is fuzzy, irresponsible, half-shot, he may never get there. Can you do anything to see he does get there? A list of stations is provided herewith.

(3) *To sell the basic idea* of a prompt accurate diagnosis and immediate treatment, instead of a stop-gap or substitute, to the person who—

(a) Describes a symptom, or asks for treatment or relief.

(b) Asks for or purchases a proprietary for venereal disease treatment.

(c) Tells a story that shows he is taking risks he doesn't realize.

(d) Has consulted a quack, or has no medical care.

Even if you know, as we all know you often do, what to give or do for a sore or discharge, you will serve defense best in the end by *not doing* it, and please remember that it is *nothing short of criminal* to give or sell anti-venereal quack remedies. Please know that syphilis and gonorrhea can be so specifically and successfully treated today that unscientific or quack treatments have no place in the picture at all. See that we get our chance to stop infectiousness on sight; to cure the resistant case, the source of the disease reservoir that keeps things going; to prevent complications; to trace infections to their source (contact-tracing); to follow up on relapsers who do not stick to treatment until non-infectious and cured. These are what keep venereal disease perpetually with us.

We can promise that nobody's confidence or privacy will be violated. A list of physicians, hospitals, clinics diagnosing venereal disease will be supplied, on request to your Health Department.

(4) *To place the facts and aims of venereal disease control before the public.* The Defense Council is sponsoring an educational campaign. Campaigns have been sponsored before and failed because they did not reach the man on the street, the people who need them, because the sponsors neglected their contacts. The pharmacists are among our chief contact-makers.

We realize that situations and clienteles vary. Some establishments and some druggists have special influence, opportunities. For those who feel that they can do little, we would, however, point out—

(a) The public is immeasurably more alert to this field, more curious, less squeamish than they were 10, even 5 years ago. THEY WANT CONTROL. You are realists. You know the public knows a lot—enough of the wrong things, half-truths rather than the facts. Help us to get the essential facts across.

(b) The publicity, posters, booklets and other educational aids are carefully prepared to give accurate facts without offense to any reasonable person. We have had special counsel in this matter.

(c) We are going on the air, are already in the press, and advertising. Your display in our behalf will increase your influence, will not make you stand out alone.

(d) The street railways of large cities, the great life insurance companies, the largest magazines are actively carrying publicity on venereal disease control.

We will supply a card or poster for counter display (preferred to window card) and booklets for distribution to inquirers. You will be approached through your local professional organization or the State Pharmaceutical Association.

If you are in a specially good position to help us or have ideas which you feel we could use, communicate by phone or letter with the sponsors.

U. S. P. Announcement

The Committee of Revision of the United States Pharmacopœia has issued an Interim Revision Announcement in order to conserve limited stocks of mercury.

Mild Mercurial Ointment has been reduced in its mercury content to not less than 9 per cent. and not more than 11 per cent. This is accomplished by reducing the amount of Strong Mercurial Ointment taken in its preparation from 600 gm. to 200 gm. per 1000 gm. finished product.

Ammoniated Mercury Ointment has been reduced in strength from 10 per cent. to 5 per cent. and its purity rubric now requires it to contain an amount of ammoniated mercury corresponding to not less than 3.5 per cent. and not more than 4.5 per cent. of Hg.

The claim is made that this reduction is entirely justified on therapeutic grounds as well as in line with necessary conservation. The changes in formulas are in effect at once, but they will not become enforceable until November 1, 1942.

SELECTED ABSTRACTS

From the Current Scientific Literature

Some Observations on Gum Tragacanth. N. A. Qazilbash. *Indian J. Pharm. III,* 189 (1941) No. 4. Gum tragacanth is the gummy exudation obtained from various species of Astragalus, growing wild on the highlands of Asia Minor, Kurdistan, Iraq, Iran, and Afghanistan. The commercial collection of the gum in the Kerman area of Iran was not practiced until recently. It was started by a few Kurds, who burnt down the main aerial portions of the plants and obtained large quantities of the gum within a short period, by suitably incising the stumps. This method is not used at present since the plants are generally destroyed.

The scarcity of gum tragacanth has created a problem. However, in Chitral there has been found a gum-yielding species, *A. strobiliferus,* Royle, which grows abundantly in several localities on arid hillsides. It yields a gum of very good quality, comparable to the best quality of Persian gum tragacanth. By proper management the areas could be enlarged so as to provide a good commercial source of tragacanth.

Further Studies on Methods of Removing Brown Stain From Mottled Teeth. H. V. Smith, M. S., and J. W. McInnes, D. D. S. *Jour. Amer. Dental Assoc. 29,* 571 (1942) No. 4. Corrosive acids should not be used to remove stain from teeth except where the stain is superficial. The acid should be applied and neutralized almost immediately if used at any time. Superoxol, or 30 per cent. hydrogen peroxide which contains stabilizing acids effectively removes the brown stain from mottled teeth if used with specific directions. It is necessary also to apply heat during the treatment. Because of the heat and the caustic nature of the agent the treatment should only be carried out by a dentist. After the treatment 5 grains of acetylsalicylic acid should be taken every two hours until bedtime to lessen the pain. If this is not effective codeine sulfate one-fourth grain and phenobarbital one-half grain should be prescribed.

Solutions of Amylocaine Hydrochloride for Surgical Use. K. Bullock and J. S. Cannell. *Quart. Jour. Pharm. and Pharmacol. XIV,* 313 (1941) No. 4. Alkaline solutions of amylocaine hydrochloride, like those of procaine hydrochloride, cannot be sterilized by heat treatment but, unlike those of procaine hydrochloride, they are relatively stable There are two available methods for preparing ampules of this substance. The first is sterilization by filtration and the second the dry salt ampul method. The various combinations for solutions of amylocaine are presented in the following table:

Solution	A	B	C	D	E	F	G	H	J	K
Amylocaine hydrochloride	2.00	2.00	2.00	2.00	0.50	0.50	0.50	5.00	5.00	5.00
Sodium chloride	0.52	0.512	—	—	0.84	0.83	—	5.00	—	—
Sodium phosphate	—	0.022	0.264	0.431	—	0.025	0.914	—	0.025	1.00
Sodium acid phosphate	—	—	0.828	0.661	—	—	0.859	—	—	4.00
pH	5.1	6.7	6.7	6.8	5.25	6.9	6.9	4.7	5.9	5.5

The ingredients are expressed in terms of percentage. A 5 per cent. or a 10 per cent. solution may be used intraspinally. For local infiltration anesthesia 0.5 per cent. to 2 per cent. solutions are advised, and for ophthalmic instillations solutions of 2 to 4 per cent. are recommended.

For a dry salt ampul to give a solution comparable to solution C with the addition of 1 in 75,000 adrenalin the following formula would be necessary:

Amylocaine hydrochloride	64.66%
Adrenalin	0.042
Sodium phosphate, anhyd.	8.52
Sodium acid phosphate, anhyd.	26.78

Another method sometimes employed is that of two solutions. The amylocaine and adrenalin would be in acid solution during sterilization and storage and the alkaline buffer solution would be added just prior to use.

Studies on the Antibacterial Action of the Sulfonamide Drugs. W. B. Wood, Jr. *Jour. of Experimental Med. 75,* 369 (1942) No. 4. Observations have been made which substantiate the theory that the sulfonamide drugs used in the treatment of bacterial infections exert

their bacteriostatic effect by competing with the essential metabolite, p-aminobenzoic acid, for an important enzyme site on the bacterial cell. p-aminobenzoic acid was shown to nullify the bacteriostatic effect of all of the six sulfanilamide compounds (sulfanilamide, diaminodiphenylsulfone, sulfaguanidine, sulfapyridine, sulfadiazine, and sulfathiazole) studied even though the drugs exhibited marked differences in chemical structure.

The bacteriostatic potency of each drug was found to be directly proportional to its ability to counteract the antibacteriostatic action of p-aminobenzoic acid. The minimum amount of drug needed to prevent bacteriostasis in each case was such that the ratio of p-aminobenzoic acid to drug was constant. The interpretation on the linear relationship of the acid and the various sulfa drugs indicates the competitive inhibition of an essential enzyme reaction by a substance chemically related to the substrate. The theoretical equation expressed the same linear relationship as did the experimental equation which further substantiated the interpretation.

Staphylococcus Aureus Meningitis. R. H. Peters, S. S. Spector, E. L. Porter, and H. Pleasants, Jr. *Pennsylvania Med. Jour. 45,* 715 (1942) No. 7. Staphylococcus aureus meningitis had always been considered fatal prior to the advent of the sulfa drugs. Sulfadiazine, used by the authors in treating such cases, has been given credit as the principal factor in bringing about recovery. The curative action of the drug was probably enhanced by the administration of the sodium salt simultaneously with the withdrawal of varying amounts of spinal fluid. Additional advantages were noted in the absence of toxic effects upon the blood and kidneys following intravenous administration of the drug. However, other treatments should not be discarded in this disease but should be carried on as supportive measures. The administration of transfusions of whole blood and the free administration of 5 per cent. glucose in normal saline solution are important. During the critical stage of the disease the levels of the drug in the blood and spinal fluid should be accurately estimated.

The Role of Acid Gastric Juice in Gastric and Duodenal Ulceration. W. L. Palmer. *Transactions and Studies of the College of Physicians of Phila. 9,* 191 (1942) No. 4. The living stomach under certain conditions is incapable of completely resisting the diges-

tive powers of the gastric juice just as is the dead stomach. This process causes peptic ulcer. Although not definitely clear, it is believed that slight mechanical injury such as the loss of the protective layer of mucus as a result of the friction of the chyme may be sufficient to allow a localized cellular necrosis with the formation of an erosion. The destructive effect of the gastric juice is responsible for the development and extension of the lesion, the pain, the chronicity, and the failure to heal. This may also occur in a neoplasm, with the result a lesion grossly indistinguishable from benign ulcer and possessing many of its essential characteristics. The perfect treatment of peptic ulcer would therefore be complete and permanent achlorhydria but thus far this is impossible.

The Pain Effects of Injections of Varying pH. Arthur W. Lupton. *Pharm. Jour. 148,* 105 (1942) No. 4090. There are a great number of variables to be considered in deciding upon the possible pain effects produced by injections of varying pH or varying tonicity. The following table shows the reactions obtained at various pH levels when 0.1 mil of solution was injected into the forearm:

pH 10 ....Slight pain, passing off quickly
pH 9 ....No pain
pH 5.5....Very slight pain as fluid enters
pH 3.5....Sharp pain. Soon disappears but reappears after about three minutes
pH 2.8....Very sharp pain, disappearing but reappears after about three minutes
pH 2.4....Searing pain, again transitory

Hypo- and hypertonic solutions followed similar lines. Other things being equal there seems to be definite evidence that the reaction and tonicity of a solution for injection are, from the point of view of pain production and tissue irritation, of secondary importance to the irritant properties of the active principle of the solution. The physiological mechanisms are able to deal with adjustments in reactions and the like but are not so powerful in dealing with irritant properties inherent in the drug.

SOLID EXTRACTS

Random but pertinent notes from the Editor's notebook

The war has accelerated Science's synthesizations. Thus, when quinine stocks in this country were frozen by a WPB order, so that the men in our armed forces might have sufficient of the drug to enable them to fight in the unaccustomed tropical zones, those of us at home took solace in the knowledge that Atabrine could take care of us, if need be, since as an antimalarial it appears to be excellent.

AJP

Morphine, too, may not be terribly missed if our stocks are depleted, for we learn of a new synthetic substance known as Dermerol, derived from atropine, and giving the relief from pain customarily looked for from morphine, yet without imparting any depression, and without becoming habit forming.

AJP

In a field remote from pharmacy and medicine, but quite essential to the war effort, we can secure further comfort from the announcement that cemented tungsten carbide, known as Carboloy, is quite plentiful, despite the fact that it was invented in Germany and its initial production in America was quite costly. This alloy is second only to diamonds in hardness, and more precious than diamonds to our welfare at this moment, for it is used for the tips of cutting tools and for wear-resistant dies.

AJP

Our supplies of vitamin A were largely obtained from Norway and Japan before the war. With the declaration of war severe dislocations in its supply have been met by a variety of measures. Thus the WLB has restricted the number of units of vitamin A in multivitamin preparations to 5000 units in the largest daily dose recommended in the directions for use. This is in line with nutritional studies indicating that, except in severe hypovitaminosis A, 5000 units a day is the maximum that the human body can utilize.

The standards of child health would be tremendously improved if the mothers of America would only use the proven immunizations available. A study has shown that although most mothers are aware of the importance and desirability of immunization many are not taking these precautionary measures.

For example, of American mothers questioned:

83 per cent. realize the desirability of immunization against smallpox but only
61 per cent. report any of their children inoculated despite mandatory legislation.
81 per cent. believe in immunization against diphtheria but only
65 per cent. report having had a single child inoculated.
47 per cent. believe their children should be immunized against whooping cough but only
31 per cent. report having had this done to any of their children.
66 per cent. realize the desirability of inoculation against typhoid yet only
19 per cent. report having had even one child immunized.
54 per cent. know people can be immunized against scarlet fever but only
10 per cent. report having had even one child immunized.

The survey also discloses that there is almost a complete lack of public knowledge of how long inoculations or vaccinations give immunity. Various estimates ranged all the way from less than a month to a lifetime, and a great majority didn't know.

AJP

The Kenney treatment of infantile paralysis has been investigated thoroughly by physicians in this country and in a recent report in the Journal of the American Medical Association *they make the astounding statement that by this treatment* "deformities are outlawed" *and that it* should be immediately adopted as the fundamental treatment given the disease. *The treatment when understood could even be administered in the patient's home, if need be, and the most important factor involved is the absolute attention given the patient without interruption. This technique should be mastered immediately by physicians in order to be prepared for the upturn of poliomyelitis cases seen each summer.*

BOOK REVIEWS

Medical Diseases in Tropical and Sub-Tropical Areas Memoranda of British War Office. 282 pages. Chemical Publishing Co., Inc., Brooklyn, N. Y., 1941. Price: $4.75.

This Memoranda on Medical Diseases in Tropical and Subtropical Areas is presented in its sixth edition by the British War Office through the Director-General of the Army Medical Services, Lieutenant-General W. P. MacArthur. It is, however, the first American edition and this 282-page volume is manufactured in this country.

As a military manual, produced under war conditions, it has been designed primarily for use in the field. Lack of bulk being an overriding consideration for such purpose, only essential material needed is included. This volume is not intended to cover the whole range of tropical medicine nor to serve as a substitute for the detailed treatises available on this subject. It, however, not only supplements these works, but it is a time-saver for the busy military medical attendant, who will have at hand quickly the essential material needed concerning these diseases. This, the first American edition, should prove of considerable value to American medical scientists, many of whom are and will find themselves as soldiers in this World Army, actually fighting, perhaps for the first time, many of the dreaded maladies considered in this volume.

Thirty-eight of the diseases and affections found in the tropics and five frequently occurring skin complaints are considered; and in each instance there is presented the etiology, symptoms, complications, diagnosis, differential diagnosis, prophylaxis, and treatment. Thirty-nine pages are given over to a consideration of the important tropical arthropod pests, including the wingless pests (lice, fleas, itch mites, ticks, ants, bedbugs and cockroaches) and the winged pests (mosquitoes and flies). All of the data contained therein are up to date and presented in the light of present-day practice and experience.

The volume contains 108 illustrations and charts, an appendix which considers the rules of zoological nomenclature so far as they

concern the medical scientist, and 17 pages of a fairly comprehensive index. The value of this work to medical scientists, especially those in military service, who will find themselves face to face with many of these maladies for the first time, cannot be overemphasized. The compactness of the volume, supplying as it does the essential information concerning tropical diseases, adds to its value. It is cordially recommended as a "must" book for those workers who will need at hand data on tropical medicine. LOUIS GERSHENFELD.

Some Landmarks in the History of the Department of Agriculture. By T. Swann Harding. U. S. Department of Agriture. 94 pages. January, 1942.

Those who are interested in the birth and development of the United States Department of Agriculture will find this volume of great historical moment. Starting as a stepchild of the Patent Office, the Department rapidly expanded and developed into an organization of much greater stature than its parent.

Since the development of this country has been in no small way due to our agricultural as well as industrial progress, the many services and contributions of the Department to farmers was to a major degree the responsible factor leading to our unexcelled agricultural production which is even yet the envy of others and bids fair to become the sustenance of the democracies.

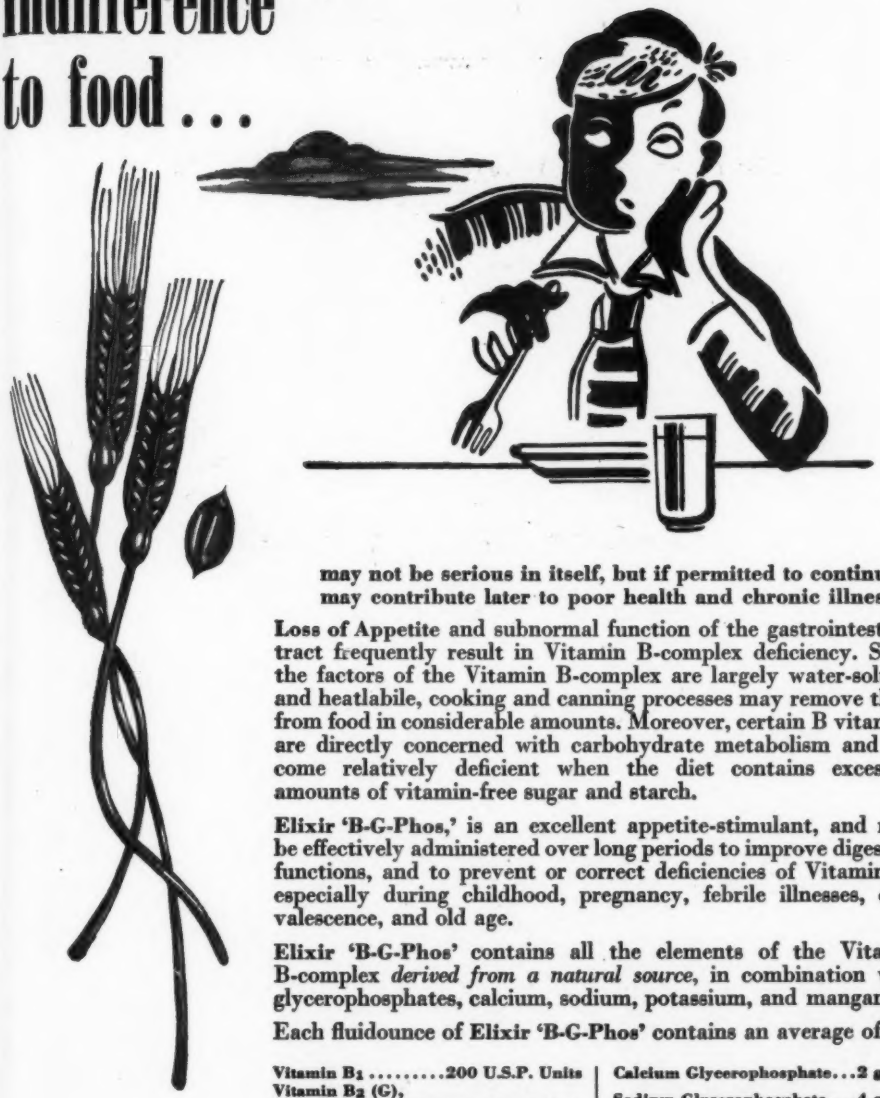
As one peruses the pages of this chronologic development, not only is agricultural history unfolded, but a real insight is gained into our political and economic growth and much of the unintelligible actions and rulings of the past and present become more understandable by the association of cause and effect.

A nation has no stronger bulwark of democracy than a prosperous, intelligent and productive farm population. The Department of Agriculture has ever sought to maintain and raise this level, as this historical brochure will prove.

It is unfortunate that the carefully collected and prepared manuscript was not more adequately bound since its contents prove far more valuable than the nondescript cover and binding would indicate.

L. F. TICE.

Indifference to food . . .



may not be serious in itself, but if permitted to continue it may contribute later to poor health and chronic illnesses.

Loss of Appetite and subnormal function of the gastrointestinal tract frequently result in Vitamin B-complex deficiency. Since the factors of the Vitamin B-complex are largely water-soluble and heatlabile, cooking and canning processes may remove them from food in considerable amounts. Moreover, certain B vitamins are directly concerned with carbohydrate metabolism and become relatively deficient when the diet contains excessive amounts of vitamin-free sugar and starch.

Elixir 'B-G-Phos,' is an excellent appetite-stimulant, and may be effectively administered over long periods to improve digestive functions, and to prevent or correct deficiencies of Vitamin B_1 especially during childhood, pregnancy, febrile illnesses, convalescence, and old age.

Elixir 'B-G-Phos' contains all the elements of the Vitamin B-complex *derived from a natural source*, in combination with glycerophosphates, calcium, sodium, potassium, and manganese.

Each fluidounce of **Elixir 'B-G-Phos'** contains an average of:

Vitamin B_1 .....200 U.S.P. Units
Vitamin B_2 (G),
100 micrograms of Riboflavin
Vitamin B_6 .....100 micrograms
With the Filtrate Factor, Nicotinic Acid, and other natural factors of the Vitamin B-complex.

Calcium Glycerophosphate...2 grains
Sodium Glycerophosphate....4 grains
Potassium Glycerophosphate, ⅜ grain
Manganese Glycerophosphate, ¼ grain
Alcohol, 17%

SHARP & DOHME'S ELIXIR B·G·PHOS